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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/618,062

07/11/2003

John R. Stowell

PD-02W150

4327

23915

7590

05/03/2006

PATENT DOCKET ADMINISTRATION

RAYTHEON SYSTEMS COMPANY

P.O. BOX 902 (E1/E150)

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EL SEGUNDO, CA 90245-0902

EXAMINER

PARRIES, DRU M

ART UNIT

PAPER NUMBER

2836

DATE MAILED: 05/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/618,062

Applicant(s)

STOWELL ET AL.

Examiner

Dru M. Parries

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 12-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 12-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see page 9, filed March 7, 2006, with respect to claim 4 have been fully considered and are persuasive. The 112 rejection of claim 4 has been withdrawn.
2. Applicant's arguments filed March 7, 2006 have been fully considered but they are not persuasive. Regarding the argument that no references teach individually controlling the outputs of the second-side converter stages, the Examiner disagrees. Jiang teaches a PWM controller which monitors the output voltage and controls a switch to help regulate the output (Col. 3, lines 1-4, 22-24).
3. The Examiner wrongfully acknowledged that claims 7-8, 12-13, 18 and 23 had allowable subject matter in them. The Examiner would like to respectfully apologize for this mistake. A new ground(s) of rejection is made in view of Giannopoulos (6,504,267). Due to this mistake, this action will be Non-Final.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-10, 12-18, and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jiang (EP 0907237) and Giannopoulos (6,504,267). Jiang teaches a power converter with a shared first-side stage (54) to receive an input (Vin). He also teaches a plurality of second-side

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converter stages (56&60, 58&62, etc.), which split the current flowing from the first-side stage, to generate an output (Vo1, Vo2, etc.). He goes on to teach control circuitry (i.e. signal generator, driver circuits) for monitoring the outputs, and controlling the switches to regulate the output voltage (Col. 2, lines 49-58; Col. 3, lines 1-10). Jiang teaches the second-side converter stages comprising a transformer (TP & TS) and a set of switching elements (S₂₂&S₂₃, S₂₄&S₂₅) that are alternatively switched on and off to regulate the output. Jiang teaches the first-side stage switches having a duty cycle of 50% and the second-side stage switches are each PWM within the 50% duty cycle of the first-side switches. Jiang teaches the first-side stage comprising first and second switching elements (S₂₀&S₂₁), a first second-side stage comprising third and fourth switches (S₂₂&S₂₃), and a second second-side stage comprising fifth and sixth switches (S₂₄&S₂₅), all which are alternatively switched on and off via PWM controller. The first, third, and fifth switching elements are switched on at substantially the same time, and the third and fifth switches will be switched off before the first (Fig. 3). Jiang also teaches the use of freewheeling diodes (Col. 3, lines 16-21). Jiang fails to teach steering circuitry for inhibiting current flow between second side converter stages. Giannopoulos teaches steering diodes (D1, D2, D3) for inhibiting current from flowing between second-side converter stages/low-side switching elements (520, 540, 560) at any time. It also inhibits current from flowing from or to a transformer (516). It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate steering diodes into Jiang's invention so that stray currents don't flow into other second-side stage converters and interfere with the regulation of their outputs. Jiang also doesn't explicitly teach the converter being a boost or buck converter. The Examiner takes Official notice that there are such elements as buck and/or boost converters. It would have

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been obvious to one of ordinary skill in the art at the time of the invention to use Jiang's converter as a buck or boost converter, so that systems when a lower voltage is needed can use this invention, and same as if when a higher voltage is needed.

6. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jiang (EP 0907237) and Giannopoulos (6,504,267) as applied to claims 12, 16, and 17 above, and further in view of Harding et al. (2002/0037796). Jiang and Giannopoulos teach a converter as described above. Jiang fails to explicitly teach an optical coupler to isolate the control circuitry from the driver circuitry. Harding teaches an optical coupler to isolate the control circuitry from any device external to the controller ([0025], lines 3-5). It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate an optical coupler into Jiang's invention to isolate the controller from driver circuitry and excess noise.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dru M. Parries whose telephone number is (571) 272-8542. The examiner can normally be reached on Monday -Thursday from 8:00am to 5:00pm. The examiner can also be reached on alternate Fridays.

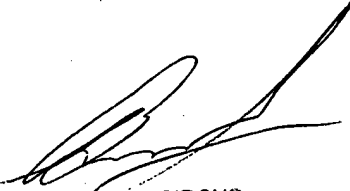
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus, can be reached on 571-272-2800 x 36. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DMP

4-28-2006



BRIAN SIRCUS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER